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Title: Out of Place: Gallstone Ileus

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Images in Radiology

Out of Place: Gallstone Ileus

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PRESENTATION

Infrequently, a gallstone can travel into the small intestine and lodge there, causing bowel blockage. This was the case for a 70-year-old man who was referred to us with abdominal pain, persistent nausea, and vomiting. He also reported dyspepsia of 3 months duration. His medical history included hypertension, chronic ischemic heart disease, and type 2 diabetes mellitus.

ASSESSMENT

On admission, the patient was mildly tachycardic and tachypneic. Physical examination revealed abdominal distension and hypoactive bowel sounds. A digital rectal examination identified soft stool, indicating that the patient was not constipated. He had no electrocardiographic abnormalities. Laboratory tests, including a normal lactate level, were unrevealing. After adequate resuscitation

with crystalloid solutions, a nasogastric tube was placed, and 1 liter of digested food was drained from the patient's stomach.

Abdominal distention and hypoactive bowel signs pointed to possible bowel blockage. Plain radiographs were unrevealing, and gas obscured ultrasound images of the biliary system. As a result, contrast-enhanced abdominal computed tomography (CT) was performed to characterize the site and etiology of obstruction. Imaging demonstrated a calculus in the duodenum, a fistula between a diminished gall bladder and dilated duodenum, and decompression of the jejunum (Figure 1).

DIAGNOSIS

Our patient had gallstone ileus, a diagnosis supported by imaging results. Only 2 findings corresponded with components of Rigler's triad: presence of an ectopic gallstone and small bowel obstruction.¹ The third, pneumobilia, or air in the biliary tree, was not documented on the images. Usually, identification of gallstone ileus is delayed, since at least half of patients do not have indicative laboratory abnormalities or a history that suggests biliary disease.²⁻³ In addition, the obstructing stone is frequently radiolucent on plain films, thus complicating the differential diagnosis.¹

MANAGEMENT

Surgery is the mainstay of treatment for gallstone ileus when patients have no risk factors for surgical complications. Enterotomy with stone removal—enterolithotomy—is necessary to relieve intestinal obstruction. Patients at average risk of operative complications have been managed with extracorporeal lithotripsy or endoscopic removal of a gallstone.⁴⁻⁵ Our patient's medical history put him at moderate to high risk for surgical complications, but endoscopic retrieval of the impacted stone could not be attempted due to its size (3.5 cm) and its position near the duodenal-jejunal junction. Instead, he underwent enterolithotomy with a longitudinal antimesenteric incision of the duodenum and extraction of a nonfriable gallstone (Figures 2 and 3).

Further management of gallstone ileus includes biliary tract inspection and cholecystectomy. Patients who are deemed at low risk per the American Society of Anesthesiologists Physical Status Classification (ASA I, normal and healthy or ASA II, mild systemic disease) can undergo the definitive biliary intervention, removal of the gall bladder and closure of the fistula, at the same time as enterolithotomy. Those in ASA III (patients with severe systemic disease) and ASA IV (patients with severe systemic disease that poses a constant threat to life) should be managed

expectantly. Our patient was discharged 7 days after surgery with a plan for future laparoscopic cholecystectomy.

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Figure 1. Contrast-enhanced computed tomography was performed. **A**, An oblique-coronal multi-planar reconstruction showed a fistula (white arrow) between the gallbladder (g) and a markedly dilated duodenum (open arrow). **B**, A narrower window-level setting in this oblique-coronal multi-planar reconstruction facilitated visualization of the calculus (c) in the duodenum. The calculus was responsible for dilation of the entire proximal duodenal lumen with decompression (white arrowheads) of the distal part of the jejunum. **C**, An axial multi-planar reconstruction allowed easy identification of the fistula (white arrow) between the gallbladder (g) and duodenum (open arrow). **D**, In this oblique-coronal multi-planar reconstruction, the gallbladder (g) was shrunken with thickened walls and partially filled with air. The white arrow points to the fistula.

Figure 2. The patient underwent enterolithotomy with longitudinal antimesenteric incision of the duodenum and extraction of a large stone.

Figure 3. A solitary and marbled gallstone, measuring 3.5 cm, was removed. It was composed of calcium salts, cholesterol, and pigment.



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